REMARKS

Applicants would like to thank Examiner Slobodyansky for her time and useful suggestions during the interview on September 6, 2002 with Applicants representatives, Cheryl H. Agris and Jason Garbell. As discussed during the interview, claims 87, 89 and 91 have been amended to more distinctly claim that which Applicant s regard as their invention. Specifically, reference to sodium ions was deleted from claim 87 and the phrase "said parent alpha-amylase comprising an active site residue" has been deleted from claims 87, 89 and 91. Furthermore, claims 87, 89 and 91 now recite "said parent alpha-amylase having at least 70% homology to SEQ ID NO:13". Claim 91 has been amended to recite in step (a) that the three-dimensional alpha amylase structure comprises a substrate binding site. The "substrate binding site" is described on page 10, line 23 to page 11, line 6.

Furthermore, the specification is objected to because Appendix 1 is present in the file as a separate entity and does not have a title. In response, the specification has been amended accordingly.

1. The Rejections Under 35 U.S.C. §112, First Paragraph

1.1 The Rejection of Claim 87

Claim 87 is rejected under 35 U.S.C. 112, first paragraph as containing subject matters which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s) as the time the application was filed, had possession of the claimed invention. It is asserted that the claim recites "amino acid residue or structural part within 10A of calcium or sodium ions". It is asserted that while the specification has support for "amino acid residue or structural part within 10A of calcium ions" (e.g., page 23, lines 22-24), the examiner is unable to locate adequate support in the specification for "amino acid residue or structural part within 10A of sodium ions".

Applicants respectfully traverse the rejection. However, in order to advance prosecution, claim 87 has been amended to recite "at least one amino acid residue or structural part within 10Å of calcium ions". Applicants however do reserve the right to file subsequent continuation and/or divisional applications on the subject matter originally contained in claim 87.

In view of the amendment of claim 87, Applicants assert that the rejection of claim 87 has been overcome. Therefore, Applicants respectfully request that the rejection be withdrawn.

1.2. The Rejection of Claims 87-92

Claims 87-92 have been rejected under 35 U.S.C. 112, first paragraph. Specifically, it is stated:

> ..because the specification while being enabling for a method of producing a variant of a parent α-amylase having a sequence of at least 70% homology to SEQ ID NO:13, does not reasonably provide enablement for a method of producing a variant of a parent α-amylase on three-dimensional structure of α-amylase of SEQ ID NO:13. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

Applicants respectfully traverse the rejection. However, in order to advance prosecution, claims 87, 89 and 91 have been amended to recite "said parent alpha-amylase having at least 70% homology to SEQ ID NO:13". Applicants however do reserve the right to file subsequent continuation and/or divisional applications on the subject matter originally contained in claims 87, 89 and 91.

In view of amendments of claims 87, 89 and 91, Applicants assert that the rejection of claims 87-92 under 35 U.S.C. 112, first paragraph have been overcome. Therefore, Applicants respectfully request that the rejections be withdrawn.

2. The Rejections Under 35 U.S.C. §112, Second Paragraph

Claims 87-92 have been rejected under 35 U.S.C. 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, it is stated:

> Claims 87-92(a) recite "generating a model of a three-dimensional structure of a parent alpha-amylase, wherein said three-dimensional alpha amylase structure comprises...defined by atomic coordinates of Appendix 1". It is not pointed out how the model is generated. Further , it is confusing because it reads on a parent alpha amylase that is a hybrid molecule comprising the residues of the amylase having coordinates defined in Appendix 1. The claims are further vague as omitting the reference to the structure of SEQ ID NO:13 that has said coordinates.

In response, Applicants note that claims 87, 89 and 91 have been amended to recite in step (a) "generating a model of a three dimensional structure of a parent alpha-amylase,using a computer programmed for generating a model structure, said parent alpha-amylase having at least 70% homology to SEQ ID NO:13, wherein said three-dimensional alpha amylase structure comprises an active site residue defined by atomic coordinates of Appendix 1". Therefore, the rejection of claims 87-92 udner 35 U.S.C. §112, second paragraph has been overcome and should be withdrawn.

3. The Double Patenting Rejection

Claims 81-83 and 86-92 have been rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-23 of U.S. Patent No. 5,989,169. Applicants respectfully traverse the rejection. However, in order to advance prosecution, a Terminal Disclaimer is herewith submitted.

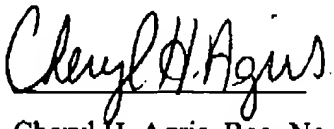
4. Conclusion

In view of the above, it is respectfully submitted that all claims are in condition for allowance. Early action to that end is respectfully requested. The Examiner

is hereby invited to contact the undersigned by telephone at (914) 712-0093 if there are any questions concerning this amendment or application.

Respectfully submitted,

Date: 9/14/02



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AMENDED CLAIMS –MARKED UP VERSION

87. (amended) A method for producing a variant of a parent alpha-amylase having an altered property relative to said parent alpha-amylase, ~~said parent alpha-amylase comprising an active site residue,~~ said method comprising

(a) generating a model of a three dimensional structure of a parent alpha-amylase, using a computer programmed for generating a model structure, said parent alpha-amylase having at least 70% homology to SEQ ID NO:13, wherein said three-dimensional alpha amylase structure comprises calcium ~~and sodium~~ ions defined by atomic coordinates of Appendix 1;

(b) utilizing said three dimensional structure generated in step(a) and modeling methods to identify in said parent alpha-amylase structure at least one amino acid residue or structural part within 10Å of calcium ~~or sodium~~ ions;

(c) modifying the sequence of a nucleic acid encoding said parent alpha-amylase to produce a nucleic acid encoding a deletion, insertion, or substitution of one or more amino acids at a position corresponding to said at least one amino acid residue identified in step (b); and

(d) expressing the modified nucleic acid in a host cell to produce said variant alpha amylase.

89. (amended) A method for producing a variant of a parent alpha-amylase having an altered property relative to said parent alpha-amylase, ~~said parent alpha-amylase comprising an active site residue,~~ said method comprising

(a) generating a model of a three dimensional structure of a parent alpha-amylase, using a computer programmed for generating a model structure, said parent alpha-amylase having at least 70% homology to SEQ ID NO:13, wherein said three-dimensional alpha-amylase structure comprises an active site residue defined by atomic coordinates of Appendix 1;

(b) utilizing said three dimensional structure generated in step (a) and modeling methods to identify in said parent alpha-amylase structure at least one amino acid residue or structural part within 15Å from said active site residue;

(c) modifying the sequence of a nucleic acid encoding said parent alpha-amylase to produce a nucleic acid encoding a deletion, insertion, or substitution of one or more amino acids at a position corresponding to said at least one amino acid residue identified in step (b); and

(d) expressing the modified nucleic acid in a host cell to produce said variant alpha-amylase.

91. (amended) A method for producing a variant of a parent alpha-amylase having an altered property relative to said parent alpha-amylase, ~~said parent alpha-amylase comprising an active site residue,~~ said method comprising

(a) generating a model of a three dimensional structure of a parent alpha-amylase, using a computer programmed for generating a model structure said parent alpha-amylase having at least 70% homology to SEQ ID NO:13, wherein said three-dimensional alpha-amylase structure comprises a substrate binding ~~area~~ site defined by atomic coordinates of Appendix 1;

(b) utilizing said three dimensional structure generated in step (a) and modeling methods to identify in said parent alpha-amylase structure the substrate binding ~~area~~site;

(c) modifying the sequence of a nucleic acid encoding said parent alpha-amylase to produce a nucleic acid encoding a deletion, insertion, or substitution of one or more amino acids at a position corresponding to said at least one amino acid residue identified in step (b); and

(d) expressing the modified nucleic acid in a host cell to produce said variant alpha-amylase.